

Unlocking gas turbine engine efficiencies through the use of SAF

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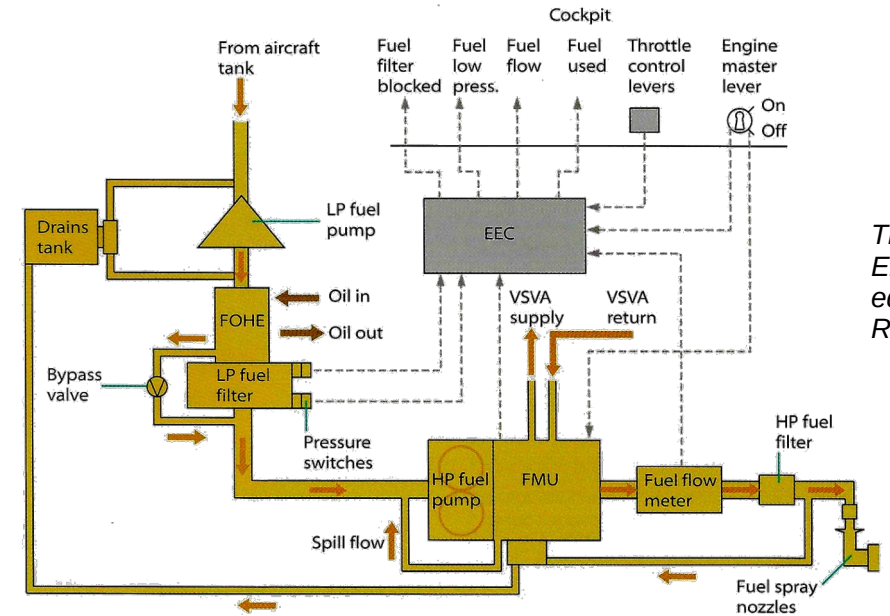
Problem statement

- **SAF producers** face significant challenges to **scale up** and **certify** their fuels for use in aircraft engines.
- **Gas turbine OEMs** are unable to predict interactions between SAF and fuel systems that can unlock further **engine efficiency**, reduce engine **emissions**, and reduce **maintenance** requirements.

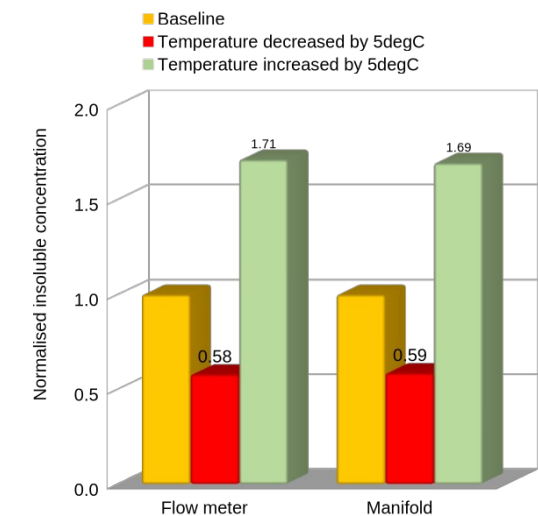
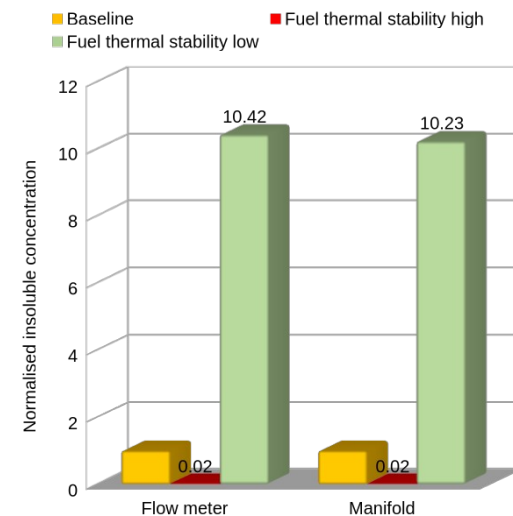


Our solution

- We developed a **software modelling tool to predict SAF interactions within engine fuel systems** in terms of thermal stability and deposition.
- Any type of SAF in any fuel system can be modelled with **minimal requirements on fuel quantity**.
- We do this by combining extensive expertise in:
 - Aviation fuel thermal degradation and deposition.
 - Fluid flow and heat transfer.
 - Numerical methods.
 - High performance computing and software development.
- Sensitive data can be protected by NDAs.

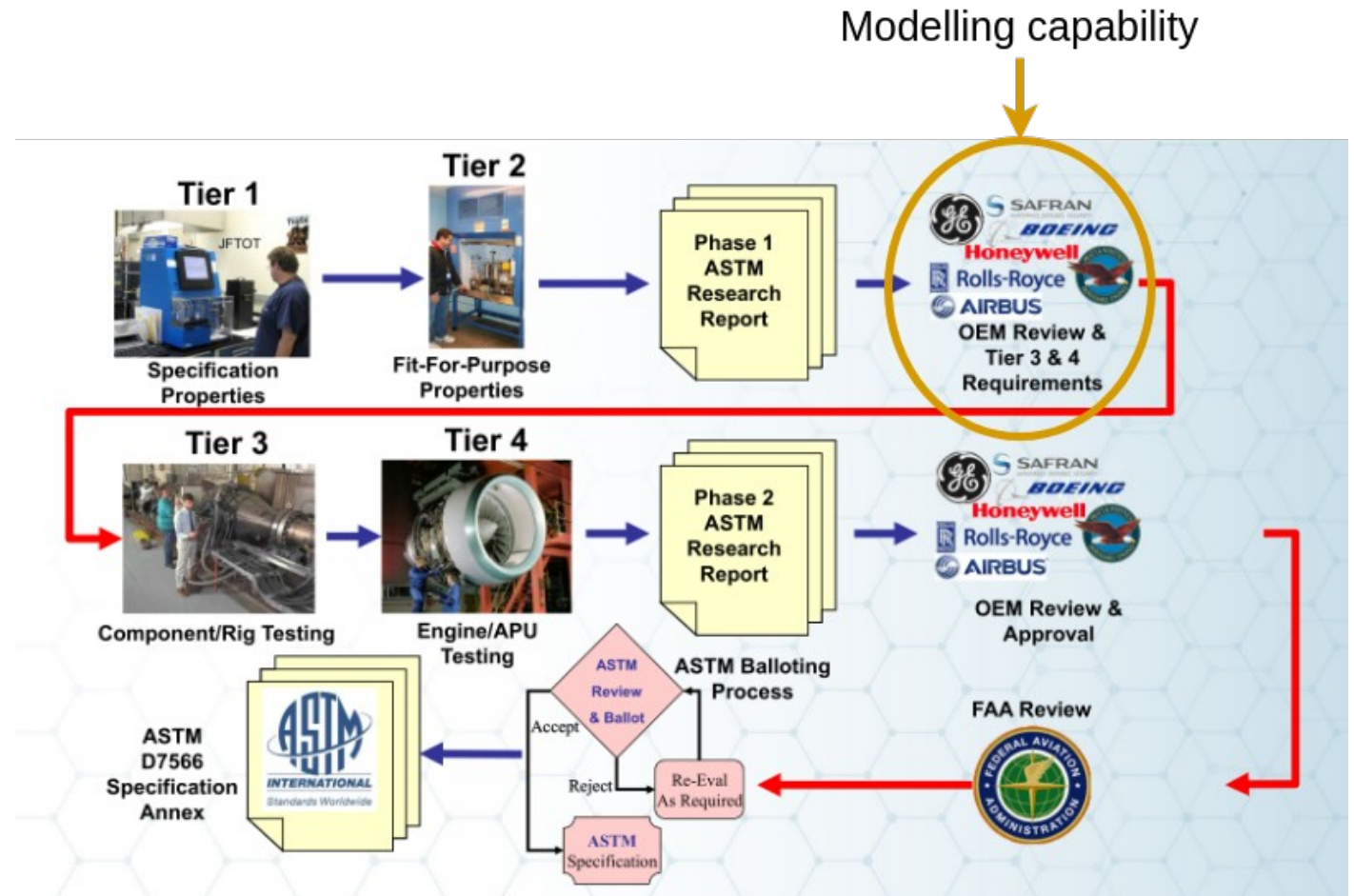


The Jet Engine, 3rd ed., Rolls Royce plc.



Benefits to SAF producers

- Early indication whether a fuel can pass **Tier 3/4 certification testing**, prior to engaging with such large scale experiments.
- **Inform producers** whether their formulation is appropriate, **prior to investment for large scale production** required for large scale testing.
- **De-risk ASTM D4054** certification by bridging the gap between Tier 1/2 and Tier 3/4 testing.



Benefits to gas turbine OEMs

- Significant **insight on how fuels interact with fuel systems** in terms of fuel thermal breakdown leading to deposits.
- OEMs can simulate numerous combinations between type of fuel (eg SAF production method), fuel system design, and operating conditions with regards to fuel thermal degradation.
- Predictive capability for using **SAF to unlock significant gains in thermodynamic efficiency.**





SUSTAINABLE BIOENERGY
SYSTEMS FOR OUR
LOW-CARBON FUTURE

Thank you

